

**BEFORE THE
PUBLIC SERVICE COMMISSION
OF SOUTH CAROLINA**

**DOCKET NO. 2019-224-E
DOCKET NO. 2019-225-E**

In the Matter of:

South Carolina Energy Freedom Act
(House Bill 3659) Proceeding Related to
S.C. Code Ann. Section 58-37-40 and
Integrated Resource Plans for Duke Energy
Carolinas, LLC and Duke Energy Progress,
LLC

**DIRECT TESTIMONY OF
GLEN A. SNIDER
ON BEHALF OF DUKE ENERGY
CAROLINAS, LLC AND DUKE
ENERGY PROGRESS, LLC**

I. INTRODUCTION AND PURPOSE

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Glen A. Snider. My business address is 526 South Church Street,
Charlotte, North Carolina 28202

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am currently employed by Duke Energy as Director of Carolinas Integrated
Resource Planning and Analytics.

**Q. PLEASE DESCRIBE YOUR CURRENT RESPONSIBILITIES IN YOUR
POSITION WITH DUKE ENERGY.**

A. I am responsible for the supervision of the Integrated Resource Plans (“IRPs”) for
both Duke Energy Carolinas, LLC (“DEC”) and Duke Energy Progress, LLC
(“DEP” and, together with DEC, the “Companies”). In addition to the production
of the IRPs, I have responsibility for overseeing the analytic functions related to
resource planning for the Carolinas region. Examples of such analytic functions
include unit retirement analyses, the analytical support for applications for
certificates of environmental compatibility and public convenience and necessity
for new generation, and analyses required to support the Companies’ avoided cost
calculations that are used in the biennial avoided cost rate proceedings.

**Q. PLEASE BRIEFLY SUMMARIZE YOUR EDUCATIONAL AND
PROFESSIONAL EXPERIENCE.**

A. My educational background includes a Bachelor of Science in mathematics and a
Bachelor of Science in economics from Illinois State University. With respect to
professional experience, I have been in the utility industry for over thirty years. I

1 started as an associate analyst with the Illinois Department of Energy and Natural
2 Resources, responsible for assisting in the review of Illinois utilities' integrated
3 resource plans. In 1992, I accepted a planning analyst job with Florida Power
4 Corporation and for the past eighteen years have held various management
5 positions within the utility industry. These positions have included managing the
6 Risk Analytics group for Progress Ventures and the Wholesale Transaction
7 Structuring group for ArcLight Energy Marketing. Immediately prior to the merger
8 of Duke Energy Corporation and Progress Energy, I was Manager of Resource
9 Planning for Progress Energy Carolinas. From 2012 to present I have held the
10 position of Director of Resource Planning and Analytics for DEC and DEP.

11 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE PUBLIC SERVICE**
12 **COMMISSION OF SOUTH CAROLINA ("COMMISSION")?**

13 A. Yes. I have testified before the Commission on a number of occasions, most
14 recently in DEC's and DEP's 2019 avoided costs proceeding, Docket Nos. 2019-
15 185-E and 2019-186-E.

16 **Q. ARE YOU INCLUDING ANY EXHIBITS IN SUPPORT OF YOUR**
17 **TESTIMONY?**

18 A. Yes. I am sponsoring the following exhibits, which are described below:

- 19 • **Snider DEC Exhibit 1** is the 2020 DEC IRP and attachments.¹ These
20 documents were filed with the Commission on September 1, 2020, with
21 minor corrections filed November 6, 2020, and are being incorporated by

¹ Please note, Attachments III and IV to the DEC IRP are being sponsored by Witness Wintermantel. Attachment V to the DEC IRP is being sponsored by Witness Bak.

reference given the size of the documents and their public availability through the Commission's Document Management System.²

- **Snider DEP Exhibit 1** is the 2020 DEP IRP, along with attachments.³

These documents were filed with the Commission on September 1, 2020, with minor corrections filed November 6, 2020, and are being incorporated by reference given the size of the documents and their public availability through the Commission's Document Management System.⁴

- **Snider DEC Exhibit 2**, attached herein, is the Executive Summary excerpted from the DEC IRP and provided with my testimony for reviewers' convenience.

- **Snider DEP Exhibit 2**, attached herein, is the Executive Summary excerpted from the DEP IRP and provided with my testimony for reviewers' convenience.

- **Snider DEC/DEP Exhibit 3** is the 2020 Integrated Resource Planning (IRP) Stakeholder Engagement Summary Report prepared by ICF.

Q. WERE THESE EXHIBITS PREPARED BY YOU OR AT YOUR DIRECTION AND UNDER YOUR SUPERVISION?

A. Yes. These exhibits were prepared by me or at my direction and under my supervision.

² The confidential versions of Attachments I and III were filed under seal on September 1, 2020, with the filing of the DEC Integrated Resource Plan and granted confidential protection by Commission Order No. 2020-616 and are incorporated herein by reference.

³ Please note, Attachments III and IV to the DEP IRP are being sponsored by Witness Wintermantel. Attachment V to the DEP IRP is being sponsored by Witness Bak.

⁴ The confidential versions of Attachments I and III were filed under seal on September 1, 2020, with the filing of the DEP Integrated Resource Plan and granted confidential protection by Commission Order No. 2020-617 and are incorporated herein by reference.

1 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**
2 **PROCEEDING?**

3 A. The purpose of my testimony is to sponsor DEC's 2020 IRP ("2020 DEC IRP")
4 and DEP's 2020 IRP ("2020 DEP IRP") into evidence and provide information on
5 how they comply with the requirements of S.C. Code Ann. § 58-37-40.
6 Additionally, I will provide an overview of their goals, preparation, contents,
7 methodologies and key conclusions, and will explain the stakeholder engagement
8 which preceded and informed these IRPs. It is important to note that the
9 Companies' IRPs contemplate multiple scenarios and are dependent upon many
10 different studies – as such, the best place to gain information about our IRPs is from
11 the actual IRPs themselves versus the testimony of any witness filed in this docket.
12 For these reasons, my testimony should be viewed as a companion to the IRPs. I
13 provide multiple page references throughout my testimony to the IRP documents,
14 as well as references to other witnesses' testimony. My testimony provides an
15 overview and explanation of the IRPs, the work that went into them, and identifies
16 subject matter experts available at the hearing to respond to contested issues and
17 Commission questions, which include:

18 Leon Brunson is a Lead Load Forecasting Analyst for the Companies.
19 Witness Brunson's testimony will provide an overview of the load forecasts used
20 in the IRPs.

21 Dewey S. (Sammy) Roberts II is General Manager Transmission Planning
22 and Operations Strategy. Witness Roberts' testimony provides an overview of the
23 grid-related analysis and investment, especially transmission investment,

1 associated with the six scenarios discussed in the IRPs. Witness Roberts also
2 discusses the DEC Integrated Voltage/VAR Control (“IVVC”) program which
3 involves the coordinated control of distribution equipment in substations and on
4 distribution lines to optimize voltages and power factors on the distribution grid.
5 The IVVC program also aids in peak load reduction.

6 Matthew Kalembe is Director DET Planning and Forecasting. Witness
7 Kalembe will provide an overview of the renewable energy and battery storage
8 inputs and assumptions used in the IRPs, along with the rooftop solar and electric
9 vehicle components of the load forecast.

10 Brian Bak is Manager DSM Analytics. In his role with the Companies,
11 Witness Bak is involved with the Energy Efficiency (“EE”) and Demand-Response
12 (“DR”) (collectively, Demand-Side Management (“DSM”) programs. Witness
13 Bak’s testimony will provide an overview of the EE and DR programs incorporated
14 into the IRPs as well as discuss the Companies’ EE and DSM Market Potential
15 Studies.

16 Nick Wintermantel is Principal Consultant and Partner at Astrapé
17 Consulting. Mr. Wintermantel will testify about the DEC and DEP Resource
18 Adequacy Studies that Astrapé conducted and the process of determining the
19 planning reserve margin for the Companies’ 2020 IRPs. Mr. Wintermantel will
20 also testify about the Storage Effective Load Carrying Capability Study that
21 Astrapé conducted for DEC and DEP to determine the capacity value of battery
22 storage.

1 Dawn Santoianni is the State Energy Policy Director – NC. Witness
2 Santoianni’s testimony provides her perspective on the carbon policies under
3 consideration in North Carolina as part of the North Carolina Clean Energy Plan
4 (“NC CEP”), the intersection of these policies with the Companies’ filed IRPs and
5 how the Companies evaluate the impact of potential policies on customers across
6 the South Carolina and North Carolina service territories. Her testimony also
7 provides her view of how investors and stakeholders have viewed the 2020 IRPs,
8 Duke Energy’s climate goals, and the goals of the NC CEP.

9 **Q. HOW IS YOUR TESTIMONY ORGANIZED?**

10 A. My testimony (1) explains the purpose of IRPs and provides an overview of the
11 Companies’ September 1, 2020 filings; (2) explains the Companies’ extensive
12 stakeholder process; (3) describes the six resource planning scenarios included in
13 the IRPs; (4) provides an overview of the DEC and DEP Resource Adequacy Study
14 and stakeholder processes relevant to such study, and (5) details the Companies’
15 compliance with the various requirements of S.C. Code Ann. § 58-37-40.

16 **II. OVERVIEW OF THE 2020 DEC AND DEP IRPs**

17 **Q. AS AN INITIAL MATTER, PLEASE DESCRIBE AN INTEGRATED**
18 **RESOURCE PLAN (“IRP”) AND ITS OBJECTIVES.**

19 A. As discussed in more detail throughout my testimony and in the Executive
20 Summaries to the DEC and DEP IRPs (DEC Exhibit 2 and DEP Exhibit 2), an IRP
21 is a long-range planning document prepared by electric utilities to provide
22 legislators, regulators, utility customers and various other stakeholders projections
23 or forecasts of how the utility’s supply-side and demand-side resources could

1 change over a 15-year planning horizon. Retirement of aging resources along with
2 growth in consumers' winter and summer peak demand needs and overall growth
3 in annual energy needs require additional resources over the planning horizon in
4 order to maintain system reliability into the future. The objectives of an IRP are to
5 balance the need for system reliability, consumer affordability and increasingly
6 clean energy supply. Like any long-range forecast, periods further out in time are
7 subject to greater levels of uncertainty. For this reason, the IRP contains multiple
8 sensitivities across different portfolios to show the impacts of these uncertainties.
9 Also, like other long-range forecasts the IRP will be updated annually with new
10 comprehensive IRPs to be completed at least every three years by statute, although
11 the practice of DEC and DEP has been to file comprehensive IRPs such as this
12 every other year.

13 **Q. PLEASE GIVE A BRIEF OVERVIEW OF THE 2020 IRPs FILED BY DEC**
14 **AND DEP.**

15 A. The 2020 DEC and DEP IRPs were prepared to conform with the requirements of
16 S.C. Code Ann. § 58-37-40 and meet all statutory requirements for approval by the
17 Commission. The 2020 IRPs contain six different resource portfolios and
18 numerous individual sensitivities to input variables as contemplated in Act 62. The
19 six resource portfolios include two base portfolios: first a "Base without Carbon
20 Policy" portfolio that does not assume future regulations on carbon dioxide and
21 second, a "Base with Carbon Policy" that assumes future regulations on carbon
22 dioxide emissions. Beyond the two base cases, four additional pathways or
23 portfolios are presented that achieve more aggressive carbon reduction goals than

1 the two base portfolios. The 2020 IRPs also compare total incremental resource
2 costs associated with each generation scenario and the associated average monthly
3 residential bill impact. The six portfolios project a range of two to four times the
4 current installed solar capacity by the end of the planning horizon reflecting the
5 Companies' commitment to aggressive addition of solar in the Carolinas. For the
6 first time, the IRPs contain both onshore and offshore Carolinas wind as potential
7 resource alternatives in several of the portfolios. A common theme across the
8 portfolios is that grid and technology improvements play an ever-important role in
9 the Companies' road to decarbonization. The IRPs include increased energy
10 storage, accelerated use of new technologies and perspective on grid investments
11 needed to support coal retirements.

12 DEC and DEP operate as individual systems and both DEC and DEP have
13 service territories across South Carolina and North Carolina. Since both DEC and
14 DEP each has a single system serving both states, each utility has a single IRP filed
15 in both states. As such, the quantitative analysis contained in both states' filings
16 are identical, although certain sections address South Carolina specific issues. It is
17 important to note that DEC and DEP cannot develop different IRPs for each system.
18 Accordingly, it is in all parties' interest that the resulting IRPs accepted or approved
19 in each state are consistent with one another.

20 **Q. WHEN DID THE COMPANIES PREPARE THE 2020 IRPS?**

21 A. After lengthy stakeholder engagement in South Carolina and North Carolina, and
22 the consideration of feedback on the Companies' resource planning processes and
23 considerations, the 2020 DEC IRP and the 2020 DEP IRP were prepared beginning

1 in the spring of 2020 and were completed in late August 2020. The modeling
2 contained in the IRPs was based on conditions that were known or forecasted at
3 that time.

4 **III. STAKEHOLDER ENGAGEMENT**

5 **Q. PLEASE DESCRIBE THE COMPANIES' IRP STAKEHOLDER** 6 **ENGAGEMENT PROCESS.**

7 A. In advance of the IRP development, the Companies actively engaged South
8 Carolina and North Carolina stakeholders including members of the South Carolina
9 Office of Regulatory Staff, North Carolina Public Staff, business customers,
10 consumer advocacy and environmental groups, as well as developers and industry
11 representatives, over a six-month period to listen, share information and solicit
12 input to help inform the planning process. The Companies initiated engagement in
13 February 2020 with local listening sessions, followed by an "IRP 101" webinar on
14 March 10, 2020, two virtual forums on March 17 and April 16 and one final webinar
15 on June 18, 2020. The Companies engaged ICF, an advisory and professional
16 services company with a specialty in utility sector planning, to facilitate the forums,
17 which, in aggregate, were attended by more than 200 stakeholder participants
18 representing a broad range of interests. For the IRP 101 webinar, ICF provided
19 industry insights and national trends for the planning process, and the Companies
20 presented information about the Companies' approach for the DEC and DEP IRPs,
21 including the 2020 regulatory requirements. Throughout the process, ICF surveyed
22 stakeholders before and after the sessions and worked with the Companies to
23 structure the sessions to address areas of greatest stakeholder interest. Based on

1 stakeholder feedback, the focus areas were identified as: resource planning, carbon
2 reduction, energy efficiency and demand response, and load forecasting. For all
3 sessions, the Companies engaged the subject matter experts for these specific areas
4 to present, address questions, and seek feedback. The Companies also created a
5 stakeholder information portal at www.duke-energy.com/irp where all materials
6 from the sessions were made available, along with the Q&As that were not able to
7 be addressed during the sessions themselves. For the June 18 webinar, the
8 Companies shared what we heard from stakeholders and provided guidance on what
9 feedback we planned to incorporate into the 2020 IRPs. A final report developed
10 by ICF is provided as DEC/DEP Exhibit 3 of this testimony.

11 **Q. WHAT ROLE DID STAKEHOLDER ENGAGEMENT HAVE IN**
12 **DEVELOPING THE 2020 IRPS?**

13 A. The stakeholders provided recommendations in the areas of resource planning,
14 carbon reduction, energy efficiency and demand response, as well as feedback on
15 the IRP development and stakeholder engagement processes. The Companies
16 incorporated this feedback in a number of ways, which are further detailed on the
17 IRP Portal and in the ICF summary report. Some of the key areas of feedback that
18 were incorporated included: portfolios that reflected multiple pathways that could
19 support more aggressive longer term glidepaths for CO₂ emissions reductions;
20 scenarios that consider a range of technologies; use of other/additional data sources
21 such as EIA's 2020 Annual Energy Outlook; recognition of wholesale market
22 solutions to reduce nearer term needs for buildout of new capacity resources;
23 expedited access to supporting technical data, including accelerating the IRP

1 technical review to September 18, 2020; and engaging industry experts to perform
2 a new study to identify future opportunities to address winter peak needs through
3 potential innovative demand-side programs and rate designs.

4 **Q. WHAT WAS THE FEEDBACK FROM STAKEHOLDERS ABOUT THE**
5 **PROCESS?**

6 A. Following each of the virtual forums, ICF administered a survey to participants to
7 solicit feedback on the sessions as well as areas of interest for future engagement.
8 Survey responses for each session are summarized in the ICF report attached as
9 DEC/DEP Exhibit 3 to this testimony. For the first two forums, on a scale of 0-10
10 with 10 being the best, stakeholders scored a 7.4 and 7.6 to the question of how
11 helpful the forum was in enhancing their understanding for the IRP process. In the
12 first two forums, stakeholders also gave the Companies a 7.2 and 7.1 score for a
13 question about their satisfaction with the opportunity to provide feedback. In the
14 first forum, for the question “how helpful was this workshop in enhancing your
15 understanding of other stakeholders’ points of view?”, the Companies received a
16 5.5 and subsequently worked with ICF to adjust the format for the second forum,
17 which included incorporating a polling option for the Q&A section where
18 stakeholders could see the questions being asked and vote for their preference, or
19 add a question of their own. Subsequently, the second forum received a 6.7 score
20 for that same question. For the final session, the Companies presented the feedback
21 it received and discussed how that feedback would be incorporated into the IRPs.
22 The Companies received a score of 7.8 for how helpful the forum was in enhancing
23 understanding of the IRP process, a 7.4 for satisfaction with the opportunity to

1 provide feedback, and a 7.5 on effectiveness of the engagement sessions and
2 process as a whole.

3 **Q. WERE THERE ANY OTHER EXTERNAL PROCESSES WHICH**
4 **INFLUENCED THE IRPs?**

5 A. Yes. While Duke Energy's own climate goals of achieving at least a 50% carbon
6 reduction by 2030 are accomplished in the base portfolios, additional portfolios
7 were analyzed to examine the potential for more aggressive carbon reductions. As
8 described by Witness Santoianni, the Companies have been engaged in the NC CEP
9 which influenced the derivation of two portfolios in the IRPs that show potential
10 pathways to 70% carbon reductions by 2030 relative to a 2005 baseline level. The
11 Companies also heard from various stakeholders about concerns over adding
12 additional natural gas generation. In response, the IRPs examined a portfolio that
13 did not allow new gas to be added to the system. As stated in the IRPs these
14 additional portfolios are, to varying degrees, dependent on continued technological
15 advancements, as well as supportive legislation.

16 **IV. DEC AND DEP POTENTIAL RESOURCE PLANS**

17 **Q. PLEASE EXPLAIN WHY THE COMPANIES HAVE EACH PROVIDED**
18 **SIX RESOURCE PORTFOLIOS.**

19 A. Section 58-37-40(B)(1)(e) of Act 62 provides that an IRP shall include, "several
20 resource portfolios developed with the purpose of fairly evaluating the range of
21 demand-side, supply-side, storage, and other technologies and services available to
22 meet the utility's service obligations." Consistent with this requirement, the
23 Companies have each provided a broad range of scenarios with a range of supply-

1 side, demand-side and storage technologies across the scenarios. The scenarios
2 presented achieve varying levels of carbon reduction, including pathways to
3 achieve up to 70% CO₂ emissions reduction by 2030 and a no new gas generation
4 scenario in the DEC and DEP IRPs. Each pathway keeps Duke Energy on a
5 trajectory to meet its near-term carbon reduction goal of at least 50% as compared
6 to 2005 levels by 2030 and long-term goal of net-zero by 2050 in the Carolinas,
7 while exploring accelerated coal retirement options, significant increases in
8 renewables, including onshore and offshore wind and further integration and
9 development of new technologies, among other scenarios. The range of scenarios
10 presented provides stakeholders, customers, legislators and regulators with insight
11 into varying possible pathways for DEC and DEP to meet their respective service
12 obligations as future industry policies and technologies evolve based on a point-in-
13 time view of modeling inputs. In addition to the information presented in the
14 Executive Summary, attached as DEC Exhibit 2 and DEP Exhibit 2, additional
15 overview and detailed discussion of each portfolio can be found in Chapter 12:
16 Evaluation and Development of the Resource Plan (beginning on page 91 of the
17 DEC IRP and Page 94 of the DEP IRP), and in Appendix A: Quantitative Analysis,
18 Sections 4 – Develop Base Planning Portfolio Configurations and Perform
19 Sensitivity Analysis and Section 5 – Development of Alternative Portfolio
20 Configurations (beginning on page 151 of both documents). Summaries of the
21 capacity changes and coal retirement dates by portfolio can be found in Appendix
22 A in Tables A-12 and A-13 (beginning on page 183 of the DEC IRP and 184 of the
23 DEP IRP).

1 **Q. PLEASE GIVE A BRIEF OVERVIEW OF THE BASE CASE WITHOUT**
2 **CARBON POLICY RESOURCE PORTFOLIO INCLUDED IN EACH IRP.**

3 A. The Base Case without Carbon Policy represents a portfolio that adheres to lowest
4 cost planning criteria with the current rules and statutes in place today. The
5 portfolio uses the retirement dates from the most economic coal retirement analysis
6 found in Table A-1 on page 146 of the DEC IRP and page 147 of the DEP IRP.
7 The optimization largely selects new natural gas generation to replace the retiring
8 coal capacity and meet future load growth. Without additional incentive from
9 energy policy, the model does not select additional solar above the base case
10 forecast, an additional 4 GW of capacity from today, which bring the combined
11 utilities total to 8 GW by the end of the IRP planning horizon. This amount includes
12 increases in installed capacity of solar through NC HB 589 and opportunities under
13 SC Act 62, along with the materialization of existing projects in the distribution
14 and transmission interconnection queues, as discussed by Witness Kalembe. Based
15 on an assumption of further price declines, battery energy storage was demonstrated
16 to be economic toward the end of the IRP planning horizon to replace peaking
17 capacity in DEP. As shown in the DEP / DEC Combined System Portfolio Results
18 Table in the Executive Summary, this portfolio achieves 56% CO₂ emissions
19 reduction through 2030, 53% through 2035, and, through 2050, this plan has a
20 Present Value Revenue Requirement ("PVRR") of \$79.8 billion. Additional
21 discussion on the Base Case without Carbon Policy portfolio can be found in
22 Appendix A beginning on page 162 of each IRP.

1 **Q. PLEASE GIVE A BRIEF OVERVIEW OF THE BASE CASE WITH**
2 **CARBON POLICY RESOURCE PORTFOLIO INCLUDED IN EACH IRP.**

3 A. The Base Case with Carbon Policy represents a portfolio that adheres to least cost
4 planning criteria under a future with carbon policy. The portfolio uses the
5 retirement dates from the most economic coal retirement analysis found in Table
6 A-1 on page 146 of the DEC IRP and page 147 of the DEP IRP. The optimization
7 selects renewables including solar, solar paired with storage, and onshore wind in
8 this scenario with a carbon policy, selecting 750 MW of onshore wind and adding
9 an additional 4 GW of solar above the forecasted solar additions in the Base Case
10 without Carbon Policy, bringing the system total to 12 GW by the end of the
11 planning horizon. This plan, as with Base Case without Carbon Policy, replaces
12 much of the retiring coal capacity with new natural gas generation to meet future
13 load growth. In the early years of the planning horizon, the model selected peaking
14 resources such as combustion turbines (“CTs”) rather than base and intermediate,
15 load-following gas generation resources like combined cycle units. Battery energy
16 storage was demonstrated to be economic in 2031 and in 2035 to replace peaking
17 capacity in DEP. As shown in the DEP / DEC Combined System Portfolio Results
18 Table in the Executive Summary, this portfolio achieves 59% CO₂ emissions
19 reduction through 2030, 62% through 2035, and, through 2050, this plan has a
20 Present Value Revenue Requirement of \$82.5 billion. This PVRR assumes carbon
21 policy does not take the form of a direct carbon tax which would need to be
22 collected through revenue requirements. Additional discussion on the Base Case

1 with Carbon Policy portfolio can be found in Appendix A beginning on page 163
2 of each IRP.

3 **Q. PLEASE GIVE A BRIEF OVERVIEW OF THE EARLIEST**
4 **PRACTICABLE COAL RETIREMENTS RESOURCE PORTFOLIO**
5 **INCLUDED IN EACH IRP.**

6 A. The Earliest Practicable Coal Retirements resource portfolio suspends normal, least
7 cost planning criteria to cease burning coal in the generation portfolio at the earliest
8 practicable date. This portfolio ceases burning coal by 2030 by retiring nearly 9.2
9 GW of coal capacity and exclusively burning natural gas at Cliffside 6 by 2030, a
10 unit which is capable of operating on both coal and gas today. The acceleration of
11 coal retirements is predicated on leveraging existing infrastructure to facilitate the
12 generation transition, taking advantage of transmission capacity, gas pipeline, and
13 access to cooling water at retiring coal sites to expedite the interconnection of
14 replacement generation. Additional discussion about the determination of earliest
15 practicable retirement dates can be found in Appendix A starting on page 173 of
16 the DEC IRP and 172 of the DEP IRP under Earliest Practicable Coal Retirement
17 Analysis and associated subsections with the retirement dates found in Table A-11.
18 This table also lists the constraining factors for each station group as to why the
19 station group cannot be further accelerated. This portfolio adds renewables
20 consistent with Base Case with Carbon Policy portfolio, bringing the total solar on
21 the combined DEP and DEC system to 12 GW, while selecting 1.3 GW of onshore
22 wind by the end 2035. As shown in the DEP / DEC Combined System Portfolio
23 Results Table in the Executive Summary, this portfolio achieves 64% CO₂

1 emissions reduction through 2030, 64% through 2035, and, through 2050, this plan
2 has a Present Value Revenue Requirement of \$84.1 billion. Additional discussion
3 on the Earliest Practicable Coal Retirements portfolio can be found in Appendix A
4 beginning on page 176 of DEC IRP and page 175 of the DEP IRP.

5 **Q. PLEASE GIVE A BRIEF OVERVIEW OF THE AGGRESSIVE CARBON**
6 **REDUCTION – WIND RESOURCE PORTFOLIO INCLUDED IN EACH**
7 **IRP.**

8 A. The 70% system CO₂ reduction with high utilization of wind resource portfolio
9 builds on the Earliest Practicable Coal Retirements resource portfolio, and further
10 deploys aggressive interconnection of carbon-free resources, especially offshore
11 wind. Utilizing the accelerated coal retirements schedule and assuming a more
12 rapid pace of renewable interconnection is enabled relative to history, this portfolio
13 integrates an additional 4 GW of solar above the Base Case with Carbon Policy and
14 Earliest Practicable Coal Retirements portfolios, bringing the combined system
15 solar total to 16 GW by the end of 2035. Along with accelerated coal retirements,
16 this resource portfolio deploys aggressive levels of EE and DR to further reduce
17 demand and achieve carbon reductions. While the accelerated coal retirements,
18 aggressive DSM, and additional solar accelerates the CO₂ reductions, they are not
19 enough to achieve the targeted deep decarbonization of the system. To further
20 reduce carbon emissions, 2.6 GW of offshore wind and 2.8 GW of onshore wind
21 are added to the system with more than 50% coming online by the start of 2030.
22 This resource plan would require high levels of coordination and effective
23 implementation to interconnect these resources along the coast of North Carolina

1 and South Carolina and distributed across the service territories and deliver this
2 carbon-free energy to load centers in the central parts of the states. This portfolio
3 continues to leverage gas generation to accelerate coal retirements and backstand
4 the increased renewables on the system, but also deploys 4.4 GW of energy storage
5 in the form of stand-alone battery, battery paired with solar, and expanded pumped
6 hydro to offset gas build and more fully utilize the variable and intermittent carbon-
7 free resources. As shown in the DEP / DEC Combined System Portfolio Results
8 Table in the Executive Summary, this portfolio achieves 70% CO₂ emissions
9 reduction through 2030, 73% through 2035, and, through 2050, this plan has a
10 Present Value Revenue Requirement of a \$100.5 billion. Additional discussion on
11 the 70% CO₂ Reduction with High Wind portfolio can be found in Appendix A
12 beginning on page 177 of DEC IRP and page 176 of the DEP IRP.

13 **Q. PLEASE GIVE A BRIEF OVERVIEW OF THE AGGRESSIVE CARBON**
14 **REDUCTION – SMALL MODULAR NUCLEAR RESOURCE**
15 **PORTFOLIO INCLUDED IN EACH IRP.**

16 A. The 70% system CO₂ reduction with accelerated deployment of small modular
17 nuclear reactors resource portfolio builds on the Earliest Practicable Coal
18 Retirements resource portfolio, and further deploys aggressive interconnection of
19 carbon-free resources, especially accelerated timelines for new nuclear generation.
20 Utilizing the accelerated coal retirements schedule, this portfolio integrates the
21 same additional 4 GW of solar over the Base Case with Carbon Policy and Earliest
22 Practicable Coal Retirements portfolio as in the 70% system CO₂ reduction with
23 high utilization of wind, bringing the combined system solar total to 16 GW by the

1 end of 2035. Along with accelerated coal retirements and an accelerated pace of
2 renewable interconnections, this resource portfolio deploys aggressive levels of EE
3 and DR to further reduce demand and achieve carbon reductions. Again, while the
4 accelerated coal retirements, aggressive DSM, and additional solar accelerates the
5 CO₂ reductions, they are not enough to achieve the targeted deep decarbonization
6 of the system. To further reduce carbon emissions, this portfolio includes 2.8 GW
7 of onshore wind and two new small modular nuclear reactor plants (“SMRs”), both
8 in service by 2030. While this timeline for deployment is aggressive, the portfolio
9 illustrates the benefits that dispatchable, load-following, carbon-free, bulk power
10 resources can provide to the system. This portfolio continues to leverage gas
11 generation to accelerate coal retirements and backstand the increased renewables
12 on the system, but also deploys 4.4 GW of energy storage in the form of stand-
13 alone battery, battery paired with solar, and expanded pumped hydro to offset gas
14 build and more fully utilize the variable and intermittent resources. As shown in
15 the DEP / DEC Combined System Portfolio Results Table in the Executive
16 Summary, this portfolio achieves 71% CO₂ emissions reduction through 2030, 74%
17 through 2035, and, through 2050, this plan has a Present Value Revenue
18 Requirement of \$95.5 billion. Additional discussion on the 70% CO₂ Reduction
19 with SMRs portfolio can be found in Appendix A beginning on page 179 of DEC
20 IRP and page 178 of the DEP IRP.

1 **Q. PLEASE GIVE A BRIEF OVERVIEW OF THE NO NEW GAS**
2 **GENERATION RESOURCE PORTFOLIO.**

3 A. The No New Gas Generation resource portfolio explores the cost, operability, and
4 carbon reduction tradeoffs for transitioning the generation portfolio without
5 deploying new natural gas generation as a transition resource. The earliest
6 practicable coal retirements were predicated on replacing the retiring coal capacity
7 by utilizing the existing infrastructure at retiring coal sites and replacing with
8 natural gas generation on site. Without implementing new natural gas generation,
9 the most economic retirement dates from the base cases were used, allowing time
10 for the build out of distributed technologies like solar (also allowing an accelerated
11 pace of interconnection relative to history) and onshore wind. Additionally, this
12 portfolio allows for the demonstration of deployment of offshore wind in the United
13 States and development of other emerging carbon-free technologies such as SMR
14 resources. This portfolio integrates 2.4 GW of offshore wind by 2030 and one small
15 modular nuclear reactor plant by 2035. To offset the need for additional capacity,
16 the Companies deploy aggressive amounts of EE and DR in this portfolio. The
17 remainder of the capacity needed to replace the still significant retirement of coal
18 generation is provided by 7.4 GW of energy storage including stand-alone battery,
19 battery paired with solar, and pumped hydro storage. As shown in the DEP / DEC
20 Combined System Portfolio Results Table in the Executive Summary, this portfolio
21 achieves 65% CO₂ emissions reduction through 2030, and 73% through 2035, and,
22 through 2050, this plan has a Present Value Revenue Requirement of \$108.1 billion.

1 Additional discussion on the No New Gas Generation portfolio can be found in
2 Appendix A beginning on page 181 of DEC IRP and page 180 of the DEP IRP.

3 **Q. HAVE THE COMPANIES MADE ANY DECISION TO ADD OR RETIRE**
4 **GENERATION RESOURCES BASED ON THE 2020 IRPs?**

5 A. No. However, it is important to note that DEC and DEP are in the process of a
6 competitive procurement for renewable generation that is consistent with the
7 modeling presented in the IRPs. Also, planned additions such as the DEC Lincoln
8 CT and the DEC Bad Creek pumped storage uprates are included in the DEC IRP
9 consistent with past IRPs. Finally, DEC is working on plans for the accelerated
10 retirement of the Allen Steam Station as discussed on page 122 of the DEC IRP. As
11 described throughout the IRPs, longer term resource additions or retirements are
12 subject to many factors that may change over time and influence future decisions
13 with respect to those resource additions or retirements. In many cases, regulatory
14 approvals from this Commission and/or the NCUC will be required as part of the
15 Companies' decision-making process for future supply-side and demand-side
16 resources.

17 **Q. ARE ALL TECHNOLOGIES OR POLICIES NECESSARY FOR THE**
18 **IMPLEMENTATION OF ALL SCENARIOS PRESENTED THE IRPs IN**
19 **PLACE TODAY?**

20 A. No. The IRPs illustrate how emerging and maturing technologies may be deployed
21 to diversify and decarbonize the generation portfolio while reliably operating the
22 system. The deployment of resources in five of the six resource plans require
23 technological and/or policy advancements in order to implement on the timeline

1 presented in the IRPs. Technological advancements required to meet the resource
2 deployments outlined in the IRPs include the development and maturation of
3 supply chain for battery storage, the advancement of the development of
4 dispatchable carbon-free technologies such as advanced nuclear, and demonstrated
5 deployment of offshore wind technologies, especially in the southeast where load
6 is generally situated inland, away from the wind resource. Policy advancements
7 may include more expeditious onshore and offshore wind siting and development
8 and associated necessary transmission build, along with improvements to siting,
9 permitting, interconnection of distributed resources, and energy policy to justify the
10 resource additions.

11 **V. RESOURCE ADEQUACY**

12 **Q. WHAT IS RESOURCE ADEQUACY?**

13 A. Resource adequacy means having sufficient resources available to reliably serve
14 electric demand especially during extreme conditions, with a high degree of
15 likelihood.

16 **Q. HOW DO THE COMPANIES ENSURE THEY WILL PROVIDE A** 17 **RELIABLE POWER SUPPLY TO CUSTOMERS?**

18 A. The Companies plan their systems to maintain a minimum planning reserve margin
19 in order to ensure a reliable power supply. Reserve margin is defined as total
20 resources minus weather normal peak demand, divided by weather normal peak
21 demand. A reserve margin of 17%, like that calculated for the Companies, means
22 that an electric system has excess capacity in the amount of 17% of expected
23 weather normal peak demand. Utilities need adequate reserve margins in order to

1 ensure they can meet the projected normal weather peak demand even if unforeseen
2 events occur, like unplanned outages of generating equipment, or higher than
3 projected peak demand due to extreme weather conditions such as a polar vortex.

4 **Q. HOW DO THE COMPANIES DETERMINE THE APPROPRIATE**
5 **RESERVE MARGIN?**

6 A. The Companies periodically conduct probabilistic studies to assess resource
7 adequacy and to determine the reserve margin needed to provide reliable service.
8 These probabilistic studies are known as Resource Adequacy or Loss of Load
9 Expectation (LOLE) studies and are commonly used in the industry to assess a
10 power system's reliability. Resource adequacy studies are also commonly referred
11 to as reserve margin studies.

12 **Q. HAVE THE COMPANIES CONDUCTED A RECENT STUDY?**

13 A. Yes. DEC and DEP retained Astrapé Consulting to conduct comprehensive
14 resource adequacy studies to determine the appropriate reserve margin for use in
15 development of the Companies' 2020 IRPs. As introduced above, Witness
16 Wintermantel of Astrapé Consulting is testifying in this proceeding as to the
17 methodology and results of the 2020 DEC and DEP Resource Adequacy Studies.
18 These studies were filed as Attachment III with the 2020 IRPs and are included as
19 exhibits to Witness Wintermantel's direct testimony in this proceeding.

20 **Q. WERE STAKEHOLDERS INVOLVED IN THE 2020 RESOURCE**
21 **ADEQUACY STUDIES?**

22 A. Yes. As discussed more fully by Witness Wintermantel, stakeholders included
23 representatives from the South Carolina Office of Regulatory Staff ("ORS"), the

1 North Carolina Public Staff and the North Carolina Attorney General's Office.
2 Stakeholders also included consultants for the ORS and Attorney General's Office.
3 Stakeholders helped to guide the key assumptions and sensitivities included in the
4 study.

5 **Q. WHAT WAS THE RECOMMENDED RESERVE MARGIN FOR THE**
6 **COMPANIES?**

7 A. Based on results from the various scenarios and sensitivities included in the
8 Resource Adequacy Studies, Astrapé recommended both utilities continue to plan
9 to a minimum 17% winter reserve margin. Accordingly, the Companies both
10 included a 17% winter reserve margin in the development of their 2020 IRPs. The
11 Companies believe that a 17% reserve margin is reasonable and appropriate for
12 inclusion in the 2020 IRPs. The Astrapé study approach and results are summarized
13 in Witness Wintermantel's testimony and are also discussed in Chapter 9 of the
14 IRPs. Finally, the complete Resource Adequacy Study can be found as Attachment
15 III to the IRPs.

16 **VI. STATUTORY REQUIREMENTS OF S.C. CODE ANN. § 58-37-40**

17 **Q. PLEASE GIVE A BRIEF OVERVIEW OF S.C. CODE ANN. § 58-37-40.**

18 A. On May 16, 2019, Governor McMaster signed into law the South Carolina Energy
19 Freedom Act ("Act 62") which in part, addresses an electric utility's IRP. Relevant
20 to this proceeding, Act 62 revised S.C. Code Ann. § 58-37-40 ("IRP Statute")
21 establishing mandatory contents of a utility's IRP and providing for certain
22 reporting requirements. The 2020 IRPs contain the necessary information required
23 by Act 62, including DEC's and DEP's long-term forecast of sales and peak

1 demand under various scenarios, projected energy purchased or produced by each
2 utility from renewable energy resources, and a summary of the electrical
3 transmission investments planned by the Companies I will next go through the
4 mandatory contents of the IRP and how we have addressed each of those
5 requirements. For the Commission's convenience, footnotes are inserted
6 referencing the specific statutory provisions being addressed below.

7 **Q. PLEASE EXPLAIN HOW THE 2020 IRPs MEET THE REQUIREMENT OF**
8 **THE IRP STATUTE FOR A "LONG-TERM FORECAST OF THE**
9 **UTILITY'S SALES AND PEAK DEMAND UNDER VARIOUS**
10 **REASONABLE SCENARIOS."**⁵

11 A. The 2020 IRPs utilize the Companies' Spring 2020 load forecast which provides
12 projections of the energy and peak demand needs for their service areas. As more
13 fully discussed in the testimony of Witness Brunson, the forecast covers the time
14 period of 2021 through 2035 and represents the needs of residential, industrial,
15 commercial, and wholesale customers. This load forecast represents the
16 expectations of customers' needs under expected circumstances. However, the
17 Companies also modeled the impacts, both high and low, of potential fluctuations
18 to the load forecast on each portfolio. High and low load forecast projections were
19 based on the near-term growth and recession scenarios provided by Moody's
20 Analytics. Details of the load forecast can be found in Chapter 3 and Appendix C
21 of the DEC and DEP IRPs.

⁵ S.C. Code Ann. § 58-37-40(B)(1)(a).

1 **Q. HOW DO THE 2020 IRPs MEET THE REQUIREMENT OF THE IRP**
2 **STATUTE TO INCLUDE “THE TYPE OF GENERATION TECHNOLOGY**
3 **PROPOSED FOR A GENERATION FACILITY CONTAINED IN THE**
4 **PLAN AND THE PROPOSED CAPACITY OF THE GENERATION**
5 **FACILITY, INCLUDING FUEL COST SENSITIVITIES UNDER VARIOUS**
6 **REASONABLE SCENARIOS?”**⁶

7 A. Included in Appendix A of the IRPs is the type of generation technologies proposed
8 for generation facilities contained in the resource portfolios in the plan along with
9 the associated proposed capacities. Numerous tables and figures in this appendix
10 contain this information including Tables A-7, A-10, A-12 and Figures A-4, A-5,
11 A-6, A-7, A-8, and A-9. These figures and tables meet this requirement showing
12 the resource changes throughout the plan and how the resource selection may shift,
13 or change based on fuel price, load, and resource cost sensitivities (Tables A-8 and
14 A-10). Additionally, each of the portfolios illustrated in the IRPs also includes
15 results discussion on the resources added to the portfolio based on economics or to
16 illustrate the desired outcome of the portfolio.

17 **Q. HOW DO THE 2020 IRPs MEET THE REQUIREMENT TO INCLUDE**
18 **“PROJECTED ENERGY PURCHASED OR PRODUCED BY THE**
19 **UTILITY FROM A RENEWABLE ENERGY RESOURCE?”**⁷

20 A. As discussed in more detail by Witness Kalemba, the six scenarios presented in the
21 IRPs contain a range of renewable resources. For each scenario in the IRPs, the

⁶ S.C. Code Ann. § 58-37-40(B)(1)(b).

⁷ S.C. Code Ann. § 58-37-40(B)(1)(c).

1 amount of assumed solar, on-shore wind and off-shore wind contained in the
2 portfolios is outlined in the Executive Summary with additional information in
3 Chapters 5 and 12 of the IRPs.

4 **Q. DO THE 2020 IRPs CONTAIN “A SUMMARY OF THE ELECTRICAL**
5 **TRANSMISSION INVESTMENTS PLANNED BY THE UTILITY?”⁸**

6 A. Yes. As explained in more detail by Witness Roberts, the IRPs contain known
7 transmission investments planned by the utilities as well as cost estimates for the
8 transmission investment needed to enable each of the six resource portfolios in the
9 IRPs. More detail is presented in Chapters 7 and 11, Appendix A and Appendix L
10 of the IRPs.

11 **Q. DO THE 2020 IRPs INCLUDE “AN EVALUATION OF LOW, MEDIUM,**
12 **AND HIGH CASES FOR THE ADOPTION OF RENEWABLE ENERGY**
13 **AND COGENERATION, ENERGY EFFICIENCY, AND DEMAND**
14 **RESPONSE MEASURES AS DIRECTED BY THE IRP STATUTE?”⁹**

15 A. Yes, the Companies developed low, medium, and high cases for the adoption of
16 renewable energy, energy efficiency, and demand response, which were evaluated
17 in the sensitivity analysis to inform the development of the alternative portfolios
18 presented in the IRPs. A description of these cases, or sensitivities, is included in
19 Appendix A, pages 155-157 for DEP and for DEC. Specifically, Table A-3 sets
20 forth the parameters for the three energy efficiency cases, Table A-4 sets for the

⁸ S.C. Code Ann. § 58-37-40(B)(1)(d).

⁹ S.C. Code Ann. § 58-37-40(B)(1)(e).

1 parameters for the three DSM cases, and Table A-5 sets forth the parameters for the
2 three renewables cases.

3 **Q. DO THE 2020 IRPs INCLUDE “SEVERAL RESOURCE PORTFOLIOS**
4 **DEVELOPED WITH THE PURPOSE OF FAIRLY EVALUATING THE**
5 **RANGE OF DEMAND-SIDE, SUPPLY-SIDE, STORAGE, AND OTHER**
6 **TECHNOLOGIES AND SERVICES AVAILABLE TO MEET THE**
7 **UTILITY'S SERVICE OBLIGATIONS” AS DIRECTED BY THE IRP**
8 **STATUTE?**¹⁰

9 A. Yes. The 2020 IRPs identify and present six resource plans that fairly reflect the
10 range of demand-side, supply-side, storage and other technologies and services that
11 are available to meet the utility's service obligations under various possible
12 sensitivities and scenarios. The 2020 IRPs contain extensive analysis and
13 discussion of the various portfolios, sensitivities and scenario analysis conducted
14 in order to evaluate the range of supply-side, demand-side, storage and other
15 technologies as outlined in Act 62. Particular IRP chapters of interest with respect
16 to this requirement are Chapters 3, 4 and 12 while Appendixes A, B C and D also
17 address this requirement.

¹⁰ *Id.*

1 **Q. DO THE 2020 IRPs INCLUDE CONSIDERATION OF “CUSTOMER**
2 **ENERGY EFFICIENCY AND DEMAND RESPONSE PROGRAMS” AS**
3 **REQUIRED BY THE IRP STATUTE?¹¹**

4 A. Yes. As Witness Bak explains in more detail, the 2020 IRPs contain an entire
5 chapter and an appendix on Energy Efficiency and Demand Response programs as
6 required by the IRP statute, Chapter 4 and Appendix D, respectively. These EE-
7 based demand and energy savings are treated as a reduction to the load forecast,
8 which also serves to reduce the associated need to build new supply-side
9 generation, transmission and distribution facilities. The IRPs also detail a variety
10 of demand-response programs that signal customers to reduce electricity use during
11 select peak hours as specified by the Companies and treats these “dispatchable”
12 types of programs as resource options that can be dispatched to meet system
13 capacity needs during periods of peak demand. Additionally, as provided in
14 Attachment V to the IRPs, the Companies commissioned an EE Market Potential
15 Study (“MPS”) in order to obtain estimates of the technical, economic and
16 achievable potential for EE savings within the DEC and DEP service areas. The
17 analysis to develop the MPS included three distinct scenarios: a Base Scenario
18 using the baseline input assumptions, an Enhanced Scenario which considered the
19 impact of increased program spending to attract new customers, and an Avoided
20 Energy Cost Sensitivity where higher future energy prices result in increased
21 economic and achievable EE savings potential. The final report, filed as Attachment
22 V to the IRPs, was prepared by Nexant, Inc. and was completed in June 2020. In

¹¹ S.C. Code Ann. § 58-37-40(B)(1)(e)(i).

1 addition to the updated MPS and consistent with feedback from stakeholders, the
2 Companies undertook a detailed study to specifically examine the potential for
3 additional winter demand-side peak savings through innovative rates initiatives
4 combined with advanced demand response and load shifting programs that were
5 outside of the MPS scope. To develop this targeted demand response study, the
6 Companies engaged Tierra Resource Consultants who collaborated with Dunskey
7 Energy Consulting and Proctor Engineering. At the time of the IRP filing, the
8 preliminary results from this study show promise for additional winter peak demand
9 savings that could move the Companies closer to the high energy efficiency and
10 demand response sensitivity identified in the IRPs. While it is premature to include
11 such findings in the Base Case forecast, the results do show a potential pathway for
12 moving closer to the High EE/DR Case identified in the IRP. Over time as new
13 programs/rate designs are approved and become established, the Companies will
14 gain additional insights into customer participation rates and peak savings potential
15 and will reflect such findings in future forecasts.

16 **Q. HOW DO THE 2020 IRPs ADDRESS THE REQUIREMENT TO INCLUDE**
17 **“DATA REGARDING THE UTILITY'S CURRENT GENERATION**
18 **PORTFOLIO, INCLUDING THE AGE, LICENSING STATUS, AND**
19 **REMAINING ESTIMATED LIFE OF OPERATION FOR EACH**
20 **FACILITY IN THE PORTFOLIO?”¹²**

21 A. The Companies provide a detailed summary of the Companies' current generation
22 portfolio in Appendix B of the IRPs. Information is provided for each unit

¹² S.C. Code Ann. § 58-37-40(B)(1)(f).

1 regarding the unit's winter and summer capacity rating, fuel type, current age,
2 estimated remaining life and licensing status, where applicable.

3 **Q. DO THE 2020 IRPs INCLUDE "PLANS FOR MEETING CURRENT AND**
4 **FUTURE CAPACITY NEEDS WITH THE COST ESTIMATES FOR ALL**
5 **PROPOSED RESOURCE PORTFOLIOS IN THE PLAN" AS REQUIRED**
6 **BY THE IRP STATUTE?**¹³

7 A. Yes. Each of the six portfolios illustrated in the IRPs meet current and future
8 capacity needs and are accompanied with the associated cost estimates for all
9 proposed resources in the portfolio. Tables A-15 and A-16 provide these cost
10 estimates for the six portfolios in each of the nine gas price and carbon tax
11 scenarios, as well as for all sensitivities presented in Table A-9 in Appendix A.
12 Summary results are also presented in the Executive Summary section of the IRPs
13 on pages 16 and 17.

14 **Q. DO THE 2020 IRPs MEET THE REQUIREMENT TO INCLUDE "AN**
15 **ANALYSIS OF THE COST AND RELIABILITY IMPACTS OF ALL**
16 **REASONABLE OPTIONS AVAILABLE TO MEET PROJECTED**
17 **ENERGY AND CAPACITY NEEDS?"**¹⁴

18 A. Yes. The DEC and DEP IRPs contain extensive analysis on the potential cost and
19 reliability impacts of each of the portfolios presented. Traditional planning analysis
20 examines costs based on a Present Value of Revenue Requirements ("PVRR") basis
21 for each portfolio. For each portfolio, the calculation examines the total operating

¹³ S.C. Code Ann. § 58-37-40(B)(1)(g).

¹⁴ S.C. Code Ann. § 58-37-40(B)(1)(h).

1 cost of the system along with incremental capital and operating costs of new
2 resources shown on a present value basis. This information is summarized in the
3 IRP's Executive Summaries and presented in more detail in Chapters 5, 11 and 12,
4 as well as Appendix A. In addition to traditional PVRR metrics, the Companies
5 also presented a residential average bill impact for each portfolio as discussed in
6 the Executive Summary and Appendix A. This additional metric provides
7 stakeholders with a more relatable measure of the cost tradeoffs between the
8 portfolios. With respect to the reliability impacts of each portfolio, the utilities are
9 responsible for maintaining adequate reserves to ensure system reliability when
10 taking into consideration resource outages and the potential for high peak loads
11 driven by extreme weather. While different resources have varying contributions
12 to system reliability, the utility must plan accordingly and ensure each portfolio
13 maintains system reliability irrespective of the resource mix selected. System
14 reliability, as well as resource contributions to reliability are discussed throughout
15 the IRP with more detail in Chapters 6 and 9, as well as Appendices A and H.
16 Further in-depth detail regarding reliability is contained DEC's and DEP's
17 Resource Adequacy Study (which are included as Attachment III to the IRPs and
18 as exhibits to Witness Wintermantel's testimony) and in the Storage Effective Load
19 Carrying Study (which is included as Attachment IV to the IRPs and as an exhibit
20 to Witness Wintermantel's testimony).

1 **Q. DO THE 2020 IRPs CONTAIN “A FORECAST OF THE UTILITY'S PEAK**
2 **DEMAND, DETAILS REGARDING THE AMOUNT OF PEAK DEMAND**
3 **REDUCTION THE UTILITY EXPECTS TO ACHIEVE, AND THE**
4 **ACTIONS THE UTILITY PROPOSES TO TAKE IN ORDER TO ACHIEVE**
5 **THAT PEAK DEMAND REDUCTION?”**¹⁵

6 **A.** Yes. The DEC and DEP IRPs contain load forecasts for annual energy growth over
7 the planning horizon, as well as winter peak demand and summer peak demand
8 growth for the same period. It should be noted that these forecasts have been
9 reduced by the projected impacts of utility sponsored EE programs. Witnesses
10 Brunson and Bak discuss the load forecast and the utilities’ energy efficiency
11 projections in their respective testimonies. Details on the load forecast can be found
12 in Chapter 3 and Appendix C, while details on the Companies’ energy efficiency
13 programs can be found in Chapter 4 and Appendix D. Of note, controllable demand
14 reduction programs such as Heating Ventilation and Air Conditioning (“HVAC”)
15 load control programs are also discussed in these chapters. While EE programs
16 reduce the load forecast, demand response programs are treated as dispatchable
17 resources within the IRP modeling framework. As such, the impacts of these
18 dispatchable DR programs are not reflected in the peak demand forecasts for the
19 utilities, but rather as a resource in Tables 12-E and 12-F of both IRPs.

¹⁵ S.C. Code Ann. § 58-37-40(B)(1)(i).

1 **Q. DO YOU HAVE ANY ADDITIONAL THOUGHTS ON THE 2020 IRPs AS**
2 **THEY RELATE TO THE IRP STATUTE?**

3 A. In summary, fifteen-year integrated resource plans involve forecasting a multitude
4 of economic, technical, and overall market variables. Items such as fifteen-year
5 forecasts for demand and energy, supply-side and demand-side technology cost and
6 performance forecasts, adoption rates for efficiency measures, commodity price
7 forecasts for coal and natural gas, impacts of future legislation, and the rate of cost
8 declines for emerging technologies are just a few examples of complex forecasts
9 that come together as part of an integrated resource planning process. Uncertainties
10 exist in any single long-range forecast and such uncertainty is exacerbated in an
11 IRP since IRPs are a culmination of several forecasted variables which drive
12 additional complexity into the planning process. The Companies believe that Act
13 62 recognizes this high degree of long-range uncertainty in that it calls for multiple
14 portfolios to be examined to cover a range of these uncertainties. Perhaps of even
15 greater importance, Act 62 calls for a comprehensive IRP to be updated at least
16 every three years with updates to the base plans to be conducted in the intervening
17 years. Historically, the Companies' practice has been to file comprehensive IRPs
18 every two years.

19 As this proceeding continues, it is important to keep in mind that although
20 the Companies went to great lengths to bring stakeholder perspectives—along with
21 significant internal and external expertise—to bear in the production of the IRPs,
22 there will likely be differing views as to underlying variables and forecasts utilized
23 in the IRPs. Given the varying perspectives of parties to this proceeding, we expect

1 different views on the various portfolios presented in the 2020 IRPs. However, the
2 IRPs as filed present a total plan that can adapt to changing standards, technology
3 and policy decisions. We believe this is consistent with Act 62, which directs the
4 Commission to approve the plan as reasonable and prudent at the time the plan was
5 reviewed by taking into consideration if the plan appropriately balances various
6 criteria addressing reliability, affordability, compliance with environmental
7 regulations, commodity price risk, diversity of supply, and other factors the
8 Commission determines to be in the public interest. The IRPs filed by the
9 Companies accomplish that goal.

10 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

11 **A. Yes.**